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RECOVERY AND GROWTH OF THE GIANT BARREL SPONGE (*XESTOSPONGIA MUTA*) FOLLOWING PHYSICAL INJURY FROM A VESSEL GROUNDING IN THE FLORIDA KEYS. *Memoirs of the Queensland Museum* 44: 532. 1999:- On February 2, 1997, the 187m (614 feet) container ship 'Contship Houston' ran aground on the Florida reef tract near Maryland Shoal within the Florida Keys National Marine Sanctuary. This incident resulted in significant injury to coral reef resources over an area 650m (2,132 feet) in length. Hundreds of the Giant Barrel Sponge (*Xestospongia muta*) were damaged or destroyed as the ship approached the final grounding site, along with thousands of scleractinian corals and other reef organisms. A major coral reef restoration project is currently underway to address the physical and biological injury caused by the grounding. Over 3,000 broken and dislodged corals were reattached to the substrate within the inbound tract of the vessel, and large areas of rubble created by the ship's hull have been stabilised through a variety of techniques.

The purpose of this study was to assess the response of injured *Xestospongia* to the physical injury caused by the vessel grounding. As the vessel approached the grounding site, sponges which were in the path of the ship were subjected to various degrees of injury. This injury ranged from the minor breaking off of the tops of the sponges to the complete destruction of the sponge except for the basal tissue attached to the substrate. I located and marked 37 injured specimens with individual tags attached to plastic cable ties positioned tightly on the upper injured surface at two locations of each sponge. I monitored the sponges at two to three month intervals and measured upward linear growth from the cable ties. I also observed the condition and vitality of each sponge and the method

by which the sponges responded to their injuries. All sponges were photographed at regular intervals.

During the course of the study, seven of the tagged sponges disappeared from the study site. Four of these were observed to have died from a wasting disease that was reported from numerous locations in the Florida Keys and the Caribbean. The causes of the disappearance of the other three were not directly observed. The 30 remaining sponges have survived and recovered from the direct physical injury at a minimum by healthy tissue regeneration of the damaged areas. The rate of upward linear growth ranged from zero to 4.48cm over 13 months, with an average upward linear growth of 1.42cm for all sponges. Eight specimens (27%) showed no upward growth over the observation period. The average growth rate for the sponges that did exhibit upward growth was 1.94cm. The most significant period of growth was in the late summer and throughout the fall, which corresponds to the period of warmest seawater temperatures. Upward linear growth was correlated with the degree of injury, with the moderate or slightly injured specimens growing at a faster rate than the badly injured ones. Of the four sponges that died from the wasting disease, three had been categorised as badly injured, which may suggest that injured sponges may be more susceptible to disease than non-injured sponges. □ *Porifera, Giant Barrel Sponge, Xestospongia muta, sponge growth rates, recovery from physical injury, coral reef injury and restoration, Florida Keys, Florida Keys National Marine Sanctuary.*

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